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THE CORRELATION OF THE PROFESSIONAL TRAINING WITH THE TEACHING SUCCESS OF NORMAL-SCHOOL GRADUATES

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This investigation of the relationship between school marks and the teaching success of normal-school graduates grew out of a study of the present status of vocational guidance. I believe that a proper statistical investigation of the various lines of human activity that demand special ability, whether mental or physical, will advance the movement for vocational guidance. This article presents the correlation of the school marks of 668 normal-school graduates with their salary during the sixth year of teaching experience.

The data presented in this article were gathered from the alumni records of three Illinois state normal schools, namely, the Illinois State Normal University, at Normal, the Northern Illinois State Normal School, at DeKalb, and the Western Illinois State Normal School, at Macomb. Each of these schools was visited by the writer, and the following information was obtained from the office records: (1) the date of graduation, (2) the salary and position during the sixth year after graduation, (3) the average academic grade, and (4) the average grade in theory and practice-teaching subjects of all graduates from the year 1902 to 1910 inclusive.

Our problem in this investigation is (1) to determine the coefficient of correlation of scholarship as indicated by average school marks with teaching success as indicated by salary during the sixth year after graduation, and (2) to suggest the significance of the facts revealed for the training and vocational guidance of teachers.

IMPLICATIONS AND SOURCES OF ERROR

1. *School marks.*—For most practical purposes the writer believes that school marks may be considered a measure of a stu-

dent's mental ability or capacity for academic accomplishment. But Dr. H. O. Rugg, in an investigation of teachers' marks and marking systems,[1] says, "The thought of specialists on the question indicates that teachers' marks measure ability or capacity only very indirectly and that directly they measure 'complex or blanket' abilities as accomplishment, attainment, or development." Rugg and Starch both found great variations among different individuals in marking the same paper. They also found variations to be as large within any one department or school as among different departments or schools. Dr. Rugg advocates the use of standardized scales and concrete methods of measurement as a means of securing greater uniformity with regard to what is measured by school marks.

This question of school marks has long been a big problem in school administration. At the Western Illinois State Normal School we found that during the years 1904 to 1908 the graded marking system was discarded entirely and students were simply marked passed or failed. Thus the records of this school during those years could not be used in our study. At the present time the Northern Illinois State Normal School uses a scale ranging from 1 to 10. The practice is to divide each of these units into four smaller ones by means of decimals, e.g., the marks from 7 to 8 are 7, 7.25, 7.50, 7.75, and 8.

In the accompanying charts and throughout this study the phrase "average academic mark or grade" means the arithmetic mean of all the grades through the normal course in the following subjects: mathematics, literature, science, foreign language, history, and the manual arts. Singing and drawing were omitted entirely because in most cases classes in those subjects meet only two hours per week. By "the average grade in theory and practice teaching" is meant the average or arithmetic mean of all the grades throughout the normal course in psychology, applied psychology, education, and practice teaching. The subjects included under the head of theory and practice teaching comprise from 25 to 35 per cent of the regular normal course.

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[1] H. O. Rugg, "Teachers' Marks and Marking Systems," *Educational Administration and Supervision*, I, 117–40.

Before averaging the grades of the Northern Illinois State Normal School they were changed to a percentage scale by moving the decimal point one place to the right.

The charts present the frequency curves of the average school marks of the graduates included in this study. The curve for the academic marks for one school will be found on the upper half of the page and the curve for the theory and practice-teaching marks for the same school on the lower half of the same page, so that the two curves may be easily compared. The average marks will be found at the base of each chart and the number of graduates receiving such marks at the left margin of the charts.

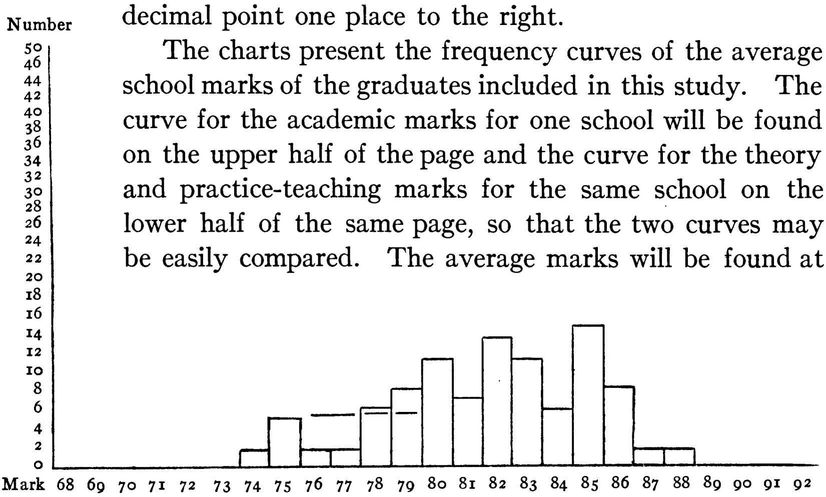

Chart I.—The average academic marks of 92 Illinois State Normal University graduates. A curve of frequency of school marks.

These charts show important variations of the average mark in professional subjects from those in the academic subjects. The curves representing the theory and practice-teaching subjects are narrower and more skewed to the high end of the scale (except in Charts I and II) than are those representing the academic marks. The president of the school represented in Charts I and II told me that he tries to supervise the marking, and when one teacher sends in marks that are not on the same basis as the others that

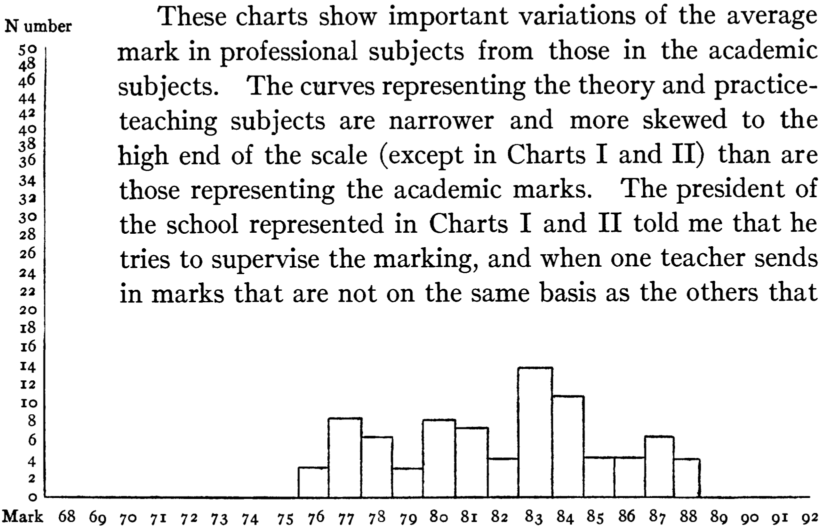

Chart II.—The average mark in theory and practice-teaching subjects of 92 Illinois State Normal University graduates. A frequency curve of school marks.

teacher is advised of the fact, and his marks that are already made out, as well as his method, are changed accordingly. The plan in this

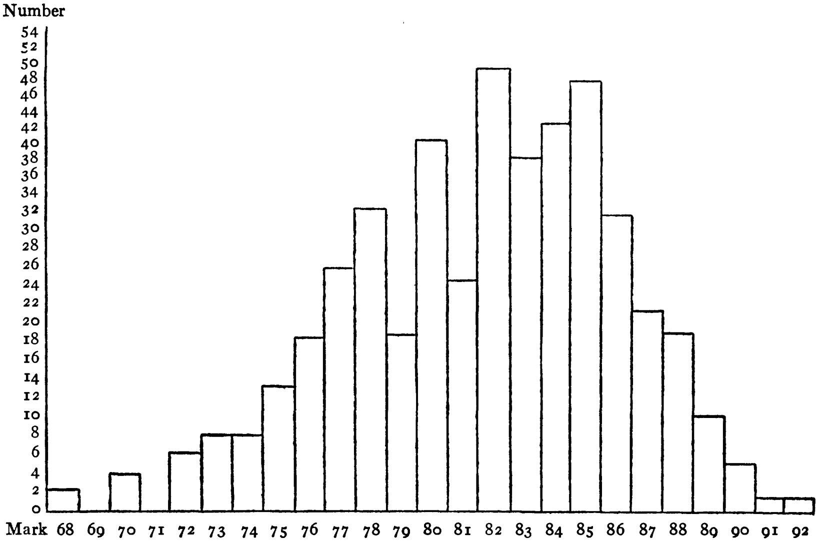

CHART III.—The average academic marks of 476 Northern Illinois State Normal School graduates. A curve of frequency of school marks.

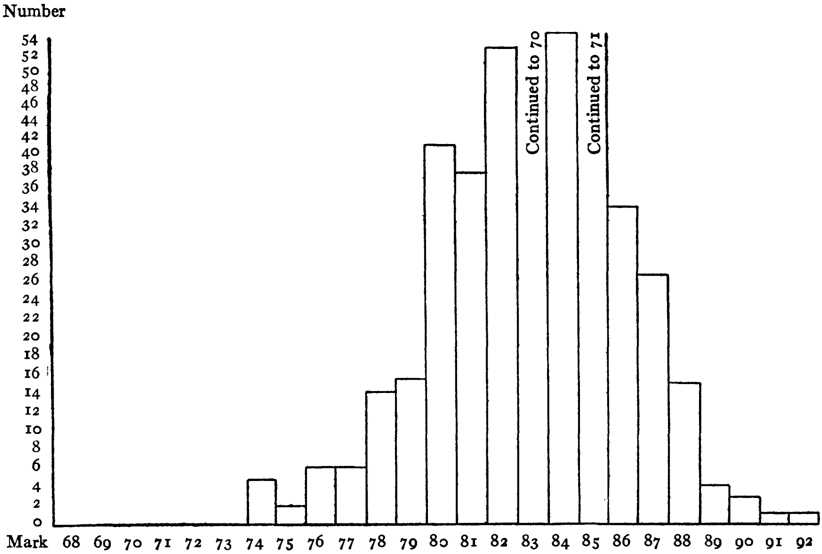

CHART IV.—The average grade in theory and practice-teaching subjects of 476 Northern Illinois State Normal School graduates. A frequency curve.

school is to use a narrow scale ranging from about 70 to 90. Each teacher is expected to distribute his marks throughout this scale and not bunch them at one end or the other unless he can give a legitimate reason for it. The individual marks at the Northern Illinois State Normal School range from 50 to 100. Charts III and IV representing this school show that the grades are distributed approximately according to the normal curve of distribution. But the fact that the marks in the professional subjects are skewed somewhat more than those in the academic subjects indicates that their scheme is not well standardized. Charts V and VI representing the Western State Normal School show that their system is not well standardized either. The marks in the professional subjects are so badly skewed to the right that they appear as if they were based on a different scale from that of the academic grades.

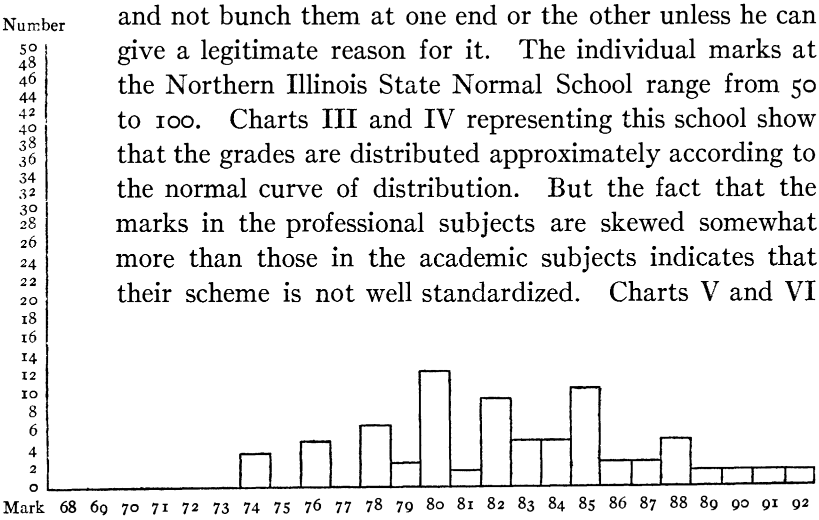

CHART V.—The average academic grades of 67 Western Illinois State Normal School graduates. A curve of frequency of the school marks.

On the whole, however, these average marks no doubt represent with a fair degree of accuracy the scholastic ability of these students. Each average mark represents from 25 to 40 individual marks (depending upon whether the student was enrolled in the two- or three-year course).

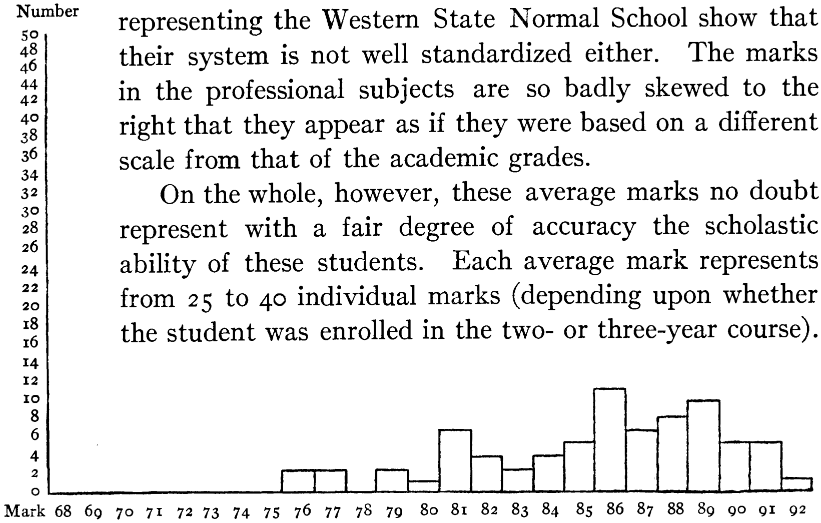

CHART VI.—The average mark in theory and practice-teaching subjects of 67 Western Illinois State Normal School graduates. A frequency curve of marks.

Each average mark in theory and practice teaching represents from 10 to 20 individual marks. In combining so many marks the errors are compensating, the high marks balancing against the low ones.

2. *Salary as a measure of teaching success.*—The amount of the average salary of graduates is taken in this study as a measure of the degree of teaching success. No doubt there are errors in this assumption that salary is an absolute measure of teaching efficiency, for there are circumstances that interfere with promotion according to merit. Some teachers will accept low salaries in order to live at or near home. In other cases favoritism and politics make abnormal conditions. Mr. Boyce, in a study of typical cities of over 10,000 population throughout the United States,[1] says that teachers are most usually rated by the unscientific general-impression method. He says, "Teaching merit is almost universally determined by some sort of rating or estimation of the value of the teacher by one or more school officers who are in a position to judge her work." From this study of typical cities he finds that the methods of rating teachers fall into two classes: (1) the general-impression method and (2) the analytical method. But in conclusion he says, "The general-impression method is doubtless characteristic of the majority of school systems and is one evidence of how little the important work of judging teaching efficiency has been systematized, rationalized, and controlled."

Because of the importance of the analytical method of rating teachers, both to our study and to the efficiency of the schools in general, the writer feels justified in summing up the important studies that have been made of it.

The analytical method is an attempt to analyze qualities of merit in teachers and rate them separately. Boyce in his study[2] presents a table of the frequency of the various qualities considered by 100 different school systems that use the analytical method of rating. There have been two other important studies similar to that of Mr. Boyce, namely, one by Ruediger and Strayer,[1] and another by Mr. Sherman Littler.[2] Ruediger and Strayer made a study of the correlation of general merit with several special qualities. Mr. Littler's study was a negative one, but the results are the same as in the other studies. He made a questionnaire study of the specific reasons given by more than 200 principals and superintendents for the dismissal of teachers from their corps.

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[1] Arthur C. Boyce, "Methods for Measuring Teachers' Efficiency," *Fourteenth Yearbook of the National Society for the Study of Education*, Part II.

[2] Arthur C. Boyce, *op. cit.*, p. 19.

The results of these three studies are grouped and compared in the following paragraphs.

Ruediger and Strayer found a correlation of ratings of teachers in general merit with ratings in other qualities in the following order:

1. Discipline
2. Teaching skill
3. Initiative
4. Personality
5. Industry
6. Following suggestions
7. Accord or ability to get along

BOYCE'S STUDY OF 100 SCHOOL SYSTEMS

	Qualities Mentioned	Frequency
1.	Discipline	49
2.	Instructional skill	30
3.	Scholarship and education	30
4.	Co-operation and loyalty	29
5.	Plan and method	28
6.	Personality	20
7.	Professional interest	16
8.	Manner	15
9.	Voice	14
10.	Daily preparation	13
11.	Accuracy and promptness	12
12.	Professional training	12
13.	Attitude toward criticism	12
14.	Appearance	11
15.	Health	11
16.	Routine	11

LITTLER'S STUDY OF FAILURE AMONG TEACHERS

Reasons for Failure	Frequency	Percent of Total
Lack of discipline	105	15.5
Lack of proper personality	100	14.8
Lack of interest in work	71	10.5
Lack of scholarship	53	7.3
Lazy, no daily preparation	48	7.1
Lack of previous preparation	29	4.3
Lack of instructional skill	29	4.3
Lack of pedagogical training	26	3.8
Failure to co-operate	25	3.7
Not progressive	23	3.4
Lack of tact or common sense	22	3.2
Lack of sympathy for children	22	3.2
Too young	19	2.8
Failure in routine	16	2.3
Immorality	12	1.8
Ill health	10	1.5

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[1] Ruediger and Strayer, "Qualities of Merit in Elementary-School Teachers," *Journal of Educational Psychology* (May, 1910), pp. 273–78.

[2] Sherman Littler, "Causes of Failure in Elementary-School Teachers," *School and Home Education*, March, 1914.

BOYCE'S STUDY OF 100 SCHOOL SYSTEMS—*Continued*

Qualities Mentioned	Frequency
17. Progressiveness	10
18. Attitude toward work	10
19. Attitude toward pupils	10
20. Character	9
21. Tact, sympathy	9
22. Skill in questioning	9
23. Personal influence	9
24. Housekeeping	8
25. Results in teaching	8

LITTLER'S STUDY OF FAILURE AMONG TEACHERS—*Continued*

Reasons for Failure	Frequency	Percent of Total
"Soft pedagogy"	7	1.1
General incompetency	7	1.1
No aim in the work	3	0.4
Too old and grown stale	2	0.3
Failure to get results	1	0.1
False conception of success	1	0.1
Clamoring for fads in text-books	1	0.1
Combination of causes	44	6.2
		99.4

If the first seven or eight points in each of these studies are compared, it will be seen that they are almost exactly the same. With so nearly the same results secured in three altogether different ways we may conclude that in the minds of school officials these qualities are most important for teaching success.

The significance of these results for our study is that teaching skill, preparation, and scholarship are each given a prominent place among qualities that make for teaching success. It appears that these attainments are first necessary, but that there are others that are very important and greatly enhance teaching efficiency.

Turning back to our question of salary as a measure of teaching efficiency, the question still confronts us as to whether salary corresponds with merit among teachers. To my knowledge no extensive scientific studies of this subject have been made, but Ruediger and Strayer in their study of the qualities of merit in teachers found a correlation between the two. They requested several of their friends who were principals to rate their teachers in various qualities and also to state the salaries of the teachers. They make the following statement concerning the results of this investigation: "The distribution of salaries appears to correspond closely with the distribution of teaching merit." In their study of five school systems they found the distribution of the average salaries per month for each grade, beginning with the first, to be respectively $70, $62, $61, $58, $63, $64, $73, and $77. These salaries, they say, "make a saddle back corresponding to that made by the distribution of the best teachers."

One would logically suppose that teachers' salaries are based upon teaching merit. There is no doubt a very strong tendency in that direction, but Professor Ruediger says:[1] "The primary basis for the promotion of teachers, both in salary and position, in American cities has in the past been, and virtually still is, length of service. . . . . In recent years, however, some form of a merit system of promotion has been adopted in many cities." He continues that in ascertaining the merit of teachers two bases are used, namely, (1) classroom efficiency and (2) growth in professional knowledge as measured by promotional examinations. But when Professor Ruediger says that the basis of promotion in American cities is length of service he is referring to the large cities, for he uses them as illustrations in this connection. Most of the larger cities have regular salary schedules providing for the increase of teachers' salaries at a uniform rate each year. But about 90 per cent of the teachers in *our* study are located during the sixth year after graduation in cities of less than 30,000 population, more than 70 per cent are located in cities of less than 20,000 population, and 57.33 per cent are in cities of less than 10,000 population (see Table IA).

TABLE IA

THE SIZE OF THE CITIES IN WHICH NORMAL-SCHOOL GRADUATES ARE LOCATED

Population of City or Town	Number of Teachers	Percentage	Population of City or Town	Number of Teachers	Percentage
100,000 and above	35	8.20	40,000–44,000...	6	1.50
95,000–99,000...	....	....	35,000–39,000...	5	1.30
90,000–94,000...	....	....	30,000–34,000...	12	2.76
85,000–89,000...	....	....	25,000–29,000...	14	3.22
80,000–84,000...	1	0.23	20,000–24,000...	30	6.90
75,000–79,000...	....	....	15,000–19,000...	23	5.30
70,000–74,000...	1	0.23	10,000–14,000...	34	7.80
65,000–69,000...	1	0.23	5,000– 9,000...	63	14.50
60,000–64,000...	1	0.23	2,500– 4,000...	63	14.50
55,000–59,000...	1	0.23	Less than 2,500..	122	28.33
50,000–54,000...	2	0.46			
45,000–49,000...	13	3.00	Totals.....	427	98.84

In these smaller cities teachers are as a rule placed more upon their merit when promotion and renewal of contracts are being considered. This is possible in the smaller towns and cities because there the superintendent and board come more into personal contact with the teachers and therefore are better able to judge as to their efficiency. In the small cities and towns, therefore, where the majority of the teachers in our study are located, salary is probably governed principally by the efficiency of the teacher.

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[1] William C. Ruediger, *Agencies for the Improvement of Teachers in Service.* United States Bulletin, 1911, No. 3.

Table IA shows the size of the cities in which the normal-school graduates of our study were located during the sixth year after their graduation. The number of graduates in these cities of various sizes may be influenced by the number of these various sizes in existence. Some of the larger cities also have training schools of their own from which they draw many of their teachers.

Table IA indicates that most of the Illinois state normal-school graduates are employed in the smaller towns and cities. Therefore the larger cities must get their teachers from some other source than the state normal schools. These conditions are probably more apparent than real, however, for there are many times more smaller towns and cities than larger ones. But, on the other hand, the large cities employ many more teachers than do the small towns. The larger cities, however, often secure many of their teachers from their own training schools. It is also probable that the entrance examinations in the larger city systems are prohibitive to many normal-school graduates. Therefore college and university graduates are more often chosen for positions in these cities except where there are city normal schools.

The bearing of these facts upon our discussion is that the teachers included in this study are teaching in small towns and cities. In these cities the school administrators and officers do not attempt to train and retain teachers in service, but they do attempt to ascertain their merit when they are considering promotion or employment of teachers.

In taking salary as a measure of teaching efficiency we shall use the annual salary during the sixth year after graduation. The reasons for doing this are as follows: First, Professor Ruediger in an extensive study of *Agencies for the Improvement of Teachers in Service* concludes as follows: "From the figures as a whole one may infer that a teacher in the grades reaches first-class efficiency in about five years, that he maintains this efficiency for about twenty years, and that after about twenty-five years of service he begins to decline."[1] Since the grade teacher reaches first-class efficiency after about five years of teaching experience, salaries do not change so fast after that time, for Professor Ruediger also uses salary as a measure of efficiency. It is therefore to be inferred from Ruediger's study that if there are increases in salary after the fifth or sixth year of service they are more likely to be based upon length of service than upon merit and are therefore not so valuable for our study. A second reason for using salary during the sixth year after graduation was because it was more convenient to use the salary as soon after graduation as possible so long as its value as a measure of teaching efficiency was not diminished.

Summing up, in this discussion of the problems and sources of error in this study, we have endeavored to show, first, that average school marks are a fairly accurate measure of mental and scholastic ability; secondly, that the amount of salary received is a measure of teaching success. Salary is the value that society places upon the individual teacher.

THE CORRELATION OF SCHOOL MARKS OF NORMAL-SCHOOL GRADUATES WITH THEIR SALARY

Correlation Tables III and VI will be found complete with the work of computing the correlation coefficients and other statistical relations. The correlation coefficient and probable error may be found at the lower right-hand corner of each table. The object in presenting the tables in this form is to allow the reader access to the complete original data from which the conclusions are drawn.

The tables have been arranged and the Pearson coefficient computed for men and women separately, because the results would be of little value if such a heterogeneous mass of material were thrown together. The product moment formula

$$r=\frac{\Sigma XY}{N\sigma_x\sigma_y}$$

is used exclusively throughout this study. The diagonal line found in each table is the line of the means. The average school marks may be found at the top of each table, and the yearly salary during

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[1] William C. Ruediger, *op. cit.*, p. 150.

TABLE III

CORRELATION OF THE SALARY OF NORMAL-SCHOOL GRADUATES DURING THE SIXTH YEAR AFTER GRADUATION, WITH THE ACADEMIC GRADES THAT THEY RECEIVED WHILE ATTENDING NORMAL SCHOOL

(MEN GRADUATES OF THREE ILLINOIS STATE NORMAL SCHOOLS)

Salary	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	f.	Unit of Dev.	f.d.	f.d.²	X·Y +
$2,000 and up	....	....	....	....	....	....	....	....	....	1	......	1	....	....	1	....	....	....	....	....	....	3	8	24	192	32
1,900–$1,999	....	....	....	....	....	....	....	....	....	....	......	....	....	1	....	....	....	....	....	....	....	1	7	7	49	21
1,800– 1,899	....	....	....	....	....	....	....	....	....	....	......	....	....	2	....	....	....	....	....	....	....	2	6	12	72	36
1,700– 1,799	....	....	....	....	....	....	....	....	....	1	......	....	....	....	....	....	....	....	....	....	....	1	5	5	25	−5
1,600– 1,699	....	....	1	....	....	....	....	1	....	....	......	1	1	....	....	....	....	....	....	....	•1	5	4	20	80	40
1,500– 1,599	....	....	1	....	....	2	....	....	1	1	......	1	2	3	....	2	1	....	....	....	....	13	3	39	117	42
1,400– 1,499	....	....	....	1	....	....	....	....	....	•	1	....	1	•	....	....	....	....	•1	....	....	4	2	8	16	6
1,300– 1,399	....	....	♦	....	....	....	....	....	2	....	4	1	....	1	•1	•	1	•1	....	....	....	11	1	11	11	15
1,200– 1,299	....	....	....	....	....	1	1	1	1	1	•2	•	•1	2	1	1	•1	....	....	....	....	13	0	126	......	....
1,100– 1,199	....	....	....	•1	....	•	....	•1	•2	1	......	2	2	2	....	....	....	....	....	....	....	11	−1	−11	11	3
1,000– 1,099	....	....	1	....	1	....	•2	....	2	....	5	2	....	....	1	....	....	....	....	....	....	14	−2	−28	56	40
900– 999	....	....	1	1	•1	1	1	1	2	....	......	1	1	3	1	1	1	....	....	....	....	16	−3	−48	144	30
800– 899	....	....	....	....	2	....	2	2	1	1	......	1	....	....	....	....	....	....	....	....	....	9	−4	−36	144	112
700– 799	....	....	....	....	....	1	....	....	1	....	......	1	1	....	....	....	....	....	....	....	....	4	−5	−20	100	20
Totals.....	....	....	4	3	4	4	6	6	12	6	12	11	9	14	5	4	4	1	1	0	1	107	.....	−133	1,017	397 − 5 = 392
Unit of Dev.	....	....	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9	10	...	$C_y = -0.157$ $C_x = -0$ 084 $\sigma_y = 3.078$ $\sigma_x = 3$ 819 $r = 0$ 33 P.E. = 0 058			
f.d........	....	....	−32	−21	−24	−20	−24	−18	−24	−6 =	−169	11	18	42	20	20″	24	7	8	0	10 =	160				
f.d.²........	....	....	256	147	144	100	96	54	48	6	......	11	36	26	80	100	144	49	64	0	100 =	1,561				

TABLE VI

Correlation of the Salary of Normal-School Graduates during the Sixth Year after Graduation, with Their Average Grade in Methods and Practice Teaching, Received while Attending Normal School

(MEN GRADUATES OF THREE ILLINOIS STATE NORMAL SCHOOLS)

Salary	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	f.	Unit of Dev	f.d.	f.d.²	X·Y +
$2,000 and up	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	1	....	....	....	....	....	3	8	24	192	56
1,900– 1,999	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	7	7	49	14
1,800– 1,899	....	....	....	....	....	....		....	....	....	....	....	....	1	....	....	....	1	....	....	....	2	6	12	72	48
1,700– 1,799	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	5	5	25	−10
1,600– 1,699	....	....	....	....	....	....	1	....	1	....	....	....	1	1	....	....	....	....	1	....	....	5	4	20	80	8
1,500– 1,599	....	....	....	....	....	....	2	1	....	....	....	3	....	2	1	3	1	....	....	....	....	13	3	39	117	30
1,400– 1,499	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	1	....	....	1	....	4	2	8	16	26
1,300– 1,399	....	....	....	....	....	1	....	1	2	....	2	2	1	1	....	....	1	....	....	....	....	11	1	11	11	−10
1,200– 1,299	....	....	....	....	....	....	....	....	....	1	....	3	3	2	1	1	2	....	....	....	....	13	0	126	....	....
1,100– 1,199	....	....	....	....	....	....	....	....	2	1	1	1	1	1	1	2	1	....	....	....	....	11	−1	− 11	11	−10
1,000– 1,099	....	....	....	....		2	....	....	2	2	....	1	1	5	1	....	....	....	....	....	....	14	−2	− 28	56	16
900– 999	....	....	....	....	1	2	....	....	....	1	....	2	2	5	....	1	1	....	1	....	....	16	−3	− 48	144	−21
800– 899	....	....	....	....	....	2	2	....	1	....	3	1	....	....	....	....	....	....	....	....	....	9	−4	− 36	144	112
700– 799		....	....	....	....	....	1	1	....	1	....	....	....	....	....	1	....	....	....	....	....	4	−5	− 20	100	35
Total....	....	....	....	....	1	7	6	3	8	8	6	14	9	20	5	9	7	1	2	1	....	107	......	−143	1,017	345−51=294
Unit of Dev.	....	....	....	....	− 7	− 6	− 5	− 4	− 3	− 2	−1	0	1	2	3	4	5	6	7	8	....	....				
f.d.......	....	....	....	....	− 7	−42	−30	−12	−24	−16	−6=	−137	9	40	15	36	35	6	14	8	....	= 163				
f.d.²....	....	....	....	....	49	252	150	48	72	32	6	. .	9	80	45	144	175	36	98	64	....	= 1,260				

$C_y = -0.157$ $C_x = 0.243$

$\sigma_y = 3.078$ $\sigma_x = 3.422$

$r = 0.25$

P.E. $= 0.0623$

the sixth year after graduation may be found at the left-hand column of the tables.

This being an extract from a more extensive study, Tables I and II, IV and V, VII, VIII, and IX, and XI, XII, and XIII are omitted from this article, but the summaries of each of these tables will be included as in the original study.

In Table I of the summary tables the correlation is high enough to indicate a rather close relation between high salary and high-school marks. In Table II, however, the correlation is so small in comparison with the P.E. that it is practically valueless. In Tables III and VI we have the data for 107 men graduates from the three normal schools combined.

SUMMARY TABLES

Table	School		P.E.
	Academic Subjects		
I	State Normal University	0.44	0.0800
II	Northern State Normal School	0.17	0.0935
III	All schools combined	0.35	0.0580
	Theory and Practice-Teaching Subjects		
IV	State Normal University	0.52	0.0780
V	Northern State Normal School	0.17	0.0935
VI	All schools combined	0.25	0.0623

One would naturally expect the degree of correlation to be much higher with marks in the professional subjects than with those in the regular academic subjects. This is true in Table IV, but not in Tables V and VI. These variations in the degree of correlation may be partly explained by the methods of grading in the different schools. By observing correlation Table VI it will be noted that all the cases except 20 fall between the points 80 and 88 on the marking scale. In Charts I to VI of this study curves of the average marks for each of the schools are plotted. Attention has been called to the fact that these charts show that marks in theory and practice teaching are bunched and skewed to the high end of the scale in the curves for the Northern and Western State Normal schools. Therefore the cause of these low correlations is no doubt partly due to poorly standardized marking systems. In the State Normal University, where the marking system probably has been better standardized and supervised,[1] the distribution of marks in the professional subjects corresponds more nearly with those for the academic subjects (see Charts I to VI). It is evident from this study that teachers' marks are not reliable unless they are supervised and standardized.

Another fact of interest to be gathered from the correlation tables is that the chances of success are just as great for students who receive marks of about 85 or 86 per cent as for those who receive 90 per cent or above. This is indicated by the fact that the line of the means does not rise with any regularity after the 85 per cent mark is reached. It is a common saying, I think, that often some of the very best students are not successful in practical life. This, I believe, is partly corroborated by these charts.

Tables X and XIV present the correlation of the school marks of 527 women graduates of Illinois state normal schools with their salary during the sixth year after graduation.

In the tables for the women graduates the correlation coefficients are much more uniform than for the men. This is probably due to the fact that there is a much larger number of cases of women than of men for each school. The coefficients are a little higher for Tables XI and XII than for the corresponding tables in academic subjects, but not enough to be of any significance.

A question that will be asked concerning these results is why the correlation is so low. In attempting to answer this we would refer the reader to the correlation tables themselves. A glance at them will show that they are more significant than the correlation coefficients would indicate. It is easily observed that there is a high correlation between low marks and low salaries, but that there is no such regularity between high marks and high salaries. The former condition is due, I think, to the fact that proper preparation and scholarship are so important to the teacher that the lack of them

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[1] President Felmley, of the State Normal University, says that he supervises personally the marking system in that school, and that if a teacher turns in grades that are not according to standard an explanation must be made or else the grades are immediately changed to standard by him and the teacher who turned in the grades.

TABLE X

Correlation of the Salary of Normal-School Graduates during the Sixth Year after Graduation, with the Academic Grades that They Received while Attending Normal School

(WOMEN GRADUATES OF THREE ILLINOIS STATE NORMAL SCHOOLS)

Salary	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	f.	Unit of Dev.	f.d.	f.d.^{2}	$X \cdot Y$	
																										+	−
$1,400–$1,449	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	14	14	196	14	
1,350– 1,399	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	13	13	169	13	
1,300– 1,349	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	2	12	24	288	36	
1,250– 1,299	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	11	11	121	...	...
1,200– 1,249	...	...	...	...	...	...	...	...	1	...	1	...	1	3	1	...	...	...	...	...	...	7	10	70	700	130	
1,150– 1,199	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	1	...	...	...	...	3	9	27	243	36	
1,100– 1,149	...	...	...	...	...	...	...	...	2	...	...	2	1	1	...	...	...	...	...	...	...	6	8	48	384	24	
1,050– 1,099	...	...	...	...	...	...	1	...	...	...	1	...	...	1	...	1	1	1	...	...	...	6	7	42	294	119	
1,000– 1,049	...	...	...	...	...	2	2	...	1	1	4	1	...	1	1	2	2	...	1	...	...	18	6	108	648	102	
950– 999	...	...	...	1	2	2	...	...	1	1	2	...	...	3	1	...	...	...	...	...	...	13	5	65	325		−95
900– 949	...	...	...	...	...	1	1	1	2	2	1	2	2	5	2	3	2	2	...	...	...	26	4	104	416	208	
850– 899	...	...	...	...	...	...	3	...	1	...	2	1	1	3	2	1	2	...	...	...	...	16	3	48	144	69	
800– 849	...	...	...	...	2	...	2	2	4	3	2	3	5	4	2	1	1	...	...	...	...	31	2	62	124	14	
750– 799	...	...	...	2	1	1	2	2	5	2	9	3	5	6	1	2	2	2	2	1	...	48	1	48 684	48	45	
700– 749	1	...	...	...	...	6	2	2	5	4	8	5	5	7	1	1	1	1	2	...	...	51	0		...	...	...
650– 699	1	1	1	2	1	2	3	2	5	2	5	7	2	3	6	2	1	2	...	...	1	49	−1	−49	49	3	
600– 649	...	1	4	5	5	3	9	7	11	5	11	9	7	8	5	2	4	...	...	...	...	96	−2	−192	384	188	
550– 599	3	3	1	2	3	2	5	2	9	3	6	3	9	6	3	4	4	...	...	...	...	68	−3	−204	612	177	
500– 549	3	3	1	2	4	3	7	3	3	3	3	3	2	3	3	1	2	...	...	...	...	49	−4	−196	784	516	
450– 499	2	2	...	1	2	...	3	2	2	1	3	2	3	3	...	2	...	1	...	...	...	29	−5	−145	725	230	
400– 449	...	...	1	1	...	2	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	5	−6	− 30	180	138	
350– 399	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	−7	− 7	49	14	
Totals	10	10	8	16	20	24	40	24	53	27	60	44	44	57	28	21	23	9	5	1	1	527	......	−823	6,883	2,076−95=1,981	
Unit of Dev.	− 10	− 9	− 8	− 7	− 6	− 5	− 4	− 3	− 2	− 1	0	1	2	3	4	5	6	7	8	9	10	....					
f.d.	−100	−90	−64	−112	−120	−120	−160	−72	−106	−27 =	−971	44	88	171	112	105	138	63	40	9	10	= 780					
f.d.^{2}	1,000	810	512	784	720	600	640	216	212	27	.....	44	176	513	448	525	828	441	320	81	100	= 8,997					

$C_y=0.2476$ $C_x=0.3624$

$\sigma_y=3.6095$ $\sigma_x=4.115$

$r=0.25$

P.E. $=0.0275$

TABLE XIV

Correlation of the Salary of Normal-School Graduates during the Sixth Year of Teaching Experience, with Their Average Grade in Methods and Practice Teaching Received when Attending Normal School

(women graduates of three illinois state normal schools)

Salary	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	f.	Unit of Dev.	f.d.	f.d.²	$X\cdot Y$ +
$1,400–$1,449	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	14	14	196	......
1,350– 1,399	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	13	13	169	......
1,300– 1,349	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	2	12	24	288	−12
1,250– 1,299	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	11	11	121	......
1,200– 1,249	....	....	....	....	....	....	....	....	....	....	....	....	1	....	3	2	1	....	....	....	....	7	10	70	700	230
1,150– 1,199	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	1	....	....	....	....	3	9	27	243	63
1,100– 1,149	....	....	....	....	....	....	....	....	2	....	....	....	1	1	....	....	2	....	....	....	....	6	8	48	384	56
1,050– 1,099	....	....	....	....	....	....	....	....	....	....	....	1	1	3	....	....	1	....	....	....	....	6	7	42	294	84
1,000– 1,049	....	....	....	....	....	....	....	2	....	2	2	1	3	1	....	3	1	1	1	....	1	18	6	108	648	180
950– 999	....	....	....	....	....	1	....	....	1	2	1	2	1	3	1	....	1	....	....	....	....	13	5	65	325	35
900– 949	....	....	....	....	1	....	....	....	....	....	2	6	5	5	3	2	1	....	1	....	....	26	4	104	416	116
850– 899	....	....	....	....	....	....	1	1	2	4	....	1	....	4	2	1	....	....	....	....	....	16	3	48	144	−15
800– 849	....	....	....	....	1	2	1	....	....	1	4	7	6	2	1	4	2	....	....	....	....	31	2	62	124	10
750– 799	....	1	....	....	....	2	2	1	2	1	6	6	1	7	7	1	6	2	....	....	....	48″	1	48	48	30
700– 749	....	....	....	....	....	....	1	2	2	3	10	8	8	7	3	4	1	....	2	....	....	51	0	684	......	......
650– 699	....	....	....	....	1	....	2	....	4	2	3	12	6	9	4	3	2	1	....	....	....	49	−1	− 49	49	−28
600– 649	....	....	....	1	2	2	3	5	12	9	12	16	10	12	4	5	3	....	....	....	....	96	−2	−192	384	106
550– 599	....	....	1	1	1	....	4	2	13	4	4	8	8	9	7	4	1	....	1	....	....	68	−3	−204	612	84
500– 549	....	....	2	1	1	1	1	1	10	7	9	5	4	4	....	2	1	....	....	....	....	49	−4	−196	784	304
450– 499	....	....	1	....	2	....	2	2	2	2	1	3	6	3	2	2	1	....	....	....	....	29	−5	−145	725	125
400– 449	....	....	....	....	1	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	5	−6	− 30	180	114
350– 399	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	−7	− 7	49	−21
Totals....	....	1	4	3	10	8	18	17	51	39	55	78	64	71	37	34	25	4	5	....	1	527	......	−823	6,883	1,537−76=1,461
Unit of Dev.	....	−10	− 9	− 8	− 7	− 6	− 5	− 4	− 3	− 2	− 1	0	1	2	3	4	5	6	7	8	9	......				
f.d.	....	−10	−36	−24	−70	−48	−90	−68	−153	−78	−55 =	−632	64	142	111	136	125	24	35	....	9 =	646				
f.d.	....	100	324	192	490	288	450	272	459	156	55	.....	64	284	333	544	625	144	245	....	81 =	5,106				

$C_y = -0\ 2476 \quad C_x = 0\ 0266$

$\sigma_y = 3\ 6095 \quad \sigma_x = 3\ 124$

$r = 0\ 25$

P.E. $= 0\ 0275$

usually precludes success in the teaching profession. We do not mean by this that there is no chance for the student with low marks to succeed. If he has the proper industry and other qualities, he may succeed in spite of low scholarship as indicated by school marks. On the other hand, from the indication of the charts, there are many who are successful in securing high-school marks, but who fail in the teaching profession. This is probably due to the fact that they lack some of the other fundamental qualities that make for success in teaching.

SUMMARY TABLE

Table	School	r	P.E.
	Academic Subjects		
VII	State Normal University	0.30	0.0868
VIII	Northern State Normal School	0.25	0.0304
IX	Western State Normal School	0.38	0.0863
X	All schools combined	0.25	0.0275
	Theory and Practice-Teaching Subjects		
XI	State Normal University	0.33	0.0846
XII	Northern State Normal School	0.25	0.0297
XIII	Western State Normal School	0.36	0.0863
XIV	All schools combined	0.25	0.0275

These correlations are no doubt also affected by the present unsystematic and unscientific methods of rating and promoting of teachers that prevail in the majority of our city systems. From the three studies of qualities of merit in teachers, summarized in this study, school systems should formulate a scientific method of analyzing, rating, and improving qualities of merit in teachers. This should be done, first, to secure justice to the teachers themselves, and, secondly, in behalf of efficiency in our schools. The degree of correlation would probably be higher also if within each school the teachers' methods of marking were better standardized and supervised. The frequency curves of the marks of the different schools show that this is done better in some schools than in others. It therefore could be done in all.

Though the degree of correlation is not high, nevertheless there is a definite consistent correlation of between .25 and .35 with a probable error of about 0.029. From these figures and from the tables the writer concludes that though scholarship is necessary it does not insure teaching success.

These findings should be of value to the vocational guidance of teachers. The tables indicate that the chances for success in the profession are very much more favorable for students with high marks. They also indicate that there are other qualities besides scholarship that make for teaching success. By analyzing the more fundamental of these other qualities, such as personality, tact, professional interest, and co-operation and loyalty, etc., and training and rating students in them during their school course, we should be able with a fair degree of accuracy to advise students as to their probable success in the teaching profession. I believe that there is legitimate ground for attempting to develop these qualities. Professor Bobbitt says that the civilized man is different from the savage; thus, he continues, if personality is made more attractive and forceful by general education and civilization it should be possible by specific analysis and training to develop these qualities still further.